SIEMENS

SIMATIC NET

Industrial Wireless LAN SCALANCE W784-1xx / SCALANCE W74x-1

Operating Instructions

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Release 06/2013

A5E01174713-10

Legal information

Warning notice system

This manual contains notices you have to observe in order to ensure your personal safety, as well as to prevent damage to property. The notices referring to your personal safety are highlighted in the manual by a safety alert symbol, notices referring only to property damage have no safety alert symbol. These notices shown below are graded according to the degree of danger.

⚠DANGER

indicates that death or severe personal injury **will** result if proper precautions are not taken.

⚠WARNING

indicates that death or severe personal injury **may** result if proper precautions are not taken.

⚠CAUTION

indicates that minor personal injury can result if proper precautions are not taken.

NOTICE

indicates that property damage can result if proper precautions are not taken.

If more than one degree of danger is present, the warning notice representing the highest degree of danger will be used. A notice warning of injury to persons with a safety alert symbol may also include a warning relating to property damage.

Qualified Personnel

The product/system described in this documentation may be operated only by **personnel qualified** for the specific task in accordance with the relevant documentation, in particular its warning notices and safety instructions. Qualified personnel are those who, based on their training and experience, are capable of identifying risks and avoiding potential hazards when working with these products/systems.

Proper use of Siemens products

Note the following:

⚠WARNING

Siemens products may only be used for the applications described in the catalog and in the relevant technical documentation. If products and components from other manufacturers are used, these must be recommended or approved by Siemens. Proper transport, storage, installation, assembly, commissioning, operation and maintenance are required to ensure that the products operate safely and without any problems. The permissible ambient conditions must be complied with. The information in the relevant documentation must be observed.

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Disclaimer of Liability

We have reviewed the contents of this publication to ensure consistency with the hardware and software described. Since variance cannot be precluded entirely, we cannot guarantee full consistency. However, the information in this publication is reviewed regularly and any necessary corrections are included in subsequent editions.

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Information on the Internet

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Bitte beachten Sie die Warnhinweise und zusätzlichen Informationen in der Betriebsanleitung (kompakt) in Ihrer Sprache im Internet:
http://support.automation.siemens.com/ww/view/at/10806097
http://support.automation.siemens.com/ww/view/ch/10806097
http://support.automation.siemens.com/ww/view/de/10806097
http://support.automation.siemens.com/ww/view/li/10806097
http://support.automation.siemens.com/ww/view/lu/10806097

Please observe the warnings and additional information in the user manual (compact) in your language in the Internet:
http://support.automation.siemens.com/ww/view/au/10806097
http://support.automation.siemens.com/ww/view/ca/10806097
http://support.automation.siemens.com/ww/view/gb/10806097
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Veuillez observer les avertissements et informations supplémentaires du manuel d’utilisation (compact) dans votre langue dans l’internet:
http://support.automation.siemens.com/ww/view/be/10806097
http://support.automation.siemens.com/ww/view/ch/10806097
http://support.automation.siemens.com/ww/view/fr/10806097
http://support.automation.siemens.com/ww/view/lu/10806097

Osservare le avvertenze di sicurezza e le informazioni aggiuntive nel manuale d'istruzioni (compatto) nella propria lingua in Internet:
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Por favor, observe las indicaciones de advertencia y las informaciones adicionales en las instrucciones de servicio (compactas) en su idioma disponibles en Internet:
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Berte prosím v úvahu výstražné pokyny a dodatečné informace v provozním návodu (kompakt) na internetu ve vaší řeči:
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Huomioi internetissä oman kielisessäsi käyttöohjeessa (kompakti) olevat varoitusohjeet ja lisäinformaatiot:
http://support.automation.siemens.com/ww/view/fi/10806097

Προσέξτε παρακαλώ τις προειδοποιητικές υποδείξεις και τις πρόσθετες πληροφορίες στις οδηγίες λειτουργίας (συνεπτηγμένες) στη γλώσσα σας στο διαδίκτυο.
http://support.automation.siemens.com/ww/view/gr/10806097

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Kérjük, vegye figyelembe az Interneten található magyar nyelvű használati utasításban (kompakt) olvasható figyelmeztető utasításokat és a kiegészítő információkat!
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يجب التنبه إلى
ارشادات التحذير و المعلومات الإضافية المذكورة في دليل التشغيل المدمج
بلغتكم و الموجود على شبكة الانترنت التحذير و المعلومات الإضافية المذكورة في
دليل التشغيل المدمج بلغتكم و الموجود على شبكة الانترنت
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http://support.automation.siemens.com/ww/view/tr/10806097

Safety instructions 2

2.1 General safety instructions for the SCALANCE W784-1xx / W74x-1

⚠ WARNING

Risk of burns due to the high temperature of the housing surface

If the ambient temperature is higher than 55 °C to 60 °C when operating a SCALANCE W784-1xx / W74x-1, the temperature of the housing can exceed 70° C. In this case, there is a risk of burns if the surface of the housing is touched.

Install the device only at a location that is accessible only for service personnel and users who are informed of the reason for the restricted access and the safety measures for operation in an ambient temperature between 55 °C to 60 °C.

⚠ WARNING

If temperatures in excess of 70° occur on the cable or at the housing socket, or the temperature at the branching points of the cables exceeds 80°, special measures need to be taken.

If the device is operated at an ambient temperature of 55 °C - 60 °C, make sure that you use cables with a permitted ambient temperature of at least 80 °C.

Introduction 3

3.1 Information on the Operating Instructions

Validity of the Operating Instructions

These operating instructions cover the following products:

- SCALANCE W784-1
- SCALANCE W784-1RR
- SCALANCE W744-1
- SCALANCE W746-1
- SCALANCE W747-1

Where the shortened name SCALANCE W784-1xx is used in this documentation, the information applies to the products SCALANCE W784-1 and SCALANCE W784-1RR. The short name SCALANCE W74x-1 stands for the products SCALANCE W744-1, SCALANCE W746-1 and SCALANCE W747-1.

These operating instructions apply to the following software version:

- SCALANCE W784-1xx / W74x-1 firmware as of version 4.4

Purpose of the Operating Instructions

Based on the Operating Instructions, you will be able to install and connect up the SCALANCE W784-1xx / W74x-1 correctly. The configuration and the integration of the SCALANCE W784-1xx / W74x-1 in a WLAN are not described in these instructions.

Documentation on the accompanying CD

You will find detailed information on configuration in the configuration manual SCALANCE W-700 on the accompanying CD in the file:

PH_SCALANCE-W-700_76.pdf

Note

Make sure that you read the explanations and instructions in the README.txt file

3.2 Type designations

Abbreviations used

The information in the manuals for the SCALANCE W-700 product family often applies to more than one product variant. In such situations, the designations of the products are shortened to avoid having to list all the type designations. The following table shows how the abbreviations relate to the product variants.

Product group	The designation . . . stands for . . .	Product name
Ethernet client modules (IP30, cabinet installation)	W74x-1	W744-1 W746-1 W747-1
Ethernet client modules (IP65, installed outside a cabinet)	W74x-1PRO/RR	W744-1PRO W746-1PRO W747-1RR
All Ethernet client modules SCALANCE W	W74x	W744-1 W746-1 W747-1 W744-1PRO W746-1PRO W747-1RR
Access points (IP30, cabinet installation)	W784-1xx	W784-1 W784-1RR
Access points (IP65, installed outside a cabinet, extreme climatic requirements)	W786-xPRO/RR	W786-1PRO W786-2PRO W786-3PRO W786-2RR
Access points (IP65, installed outside a cabinet)	W788-xPRO/RR	W788-1PRO W788-2PRO W788-1RR W788-2RR
Access points with the "RR" range of functions	W78x-xRR	W784-1RR W786-2RR W788-1RR W788-2RR

Product group	The designation . . . stands for . . .	Product name
All SCALANCE W access points	W78x	W788-1PRO W788-2PRO W788-1RR W788-2RR W786-1PRO W786-2PRO W786-3PRO W786-2RR W784-1 W784-1RR
All SCALANCE W devices	W -700	W788-1PRO W788-2PRO W788-1RR W788-2RR W744-1PRO W746-1PRO W747-1RR W786-1PRO W786-2PRO W786-3PRO W786-2RR W784-1 W784-1RR W744-1 W746-1 W747-1

Description

4

4.1 Components of the product

The following components are supplied with the device

- SCALANCE W784-1xx or W74x-1
- 1 connector for the power supply
- 1 SIMATIC NET Industrial Wireless LAN CD

Antennas are not supplied with this device.

Please check that the consignment you have received is complete. If it is not complete, please contact your supplier or your local Siemens office.

4.2 LED display

Information on operating status and data transfer

On the front of the housing, several LEDs provide information on the operating status of the SCALANCE W784-1xx / W74x-1:

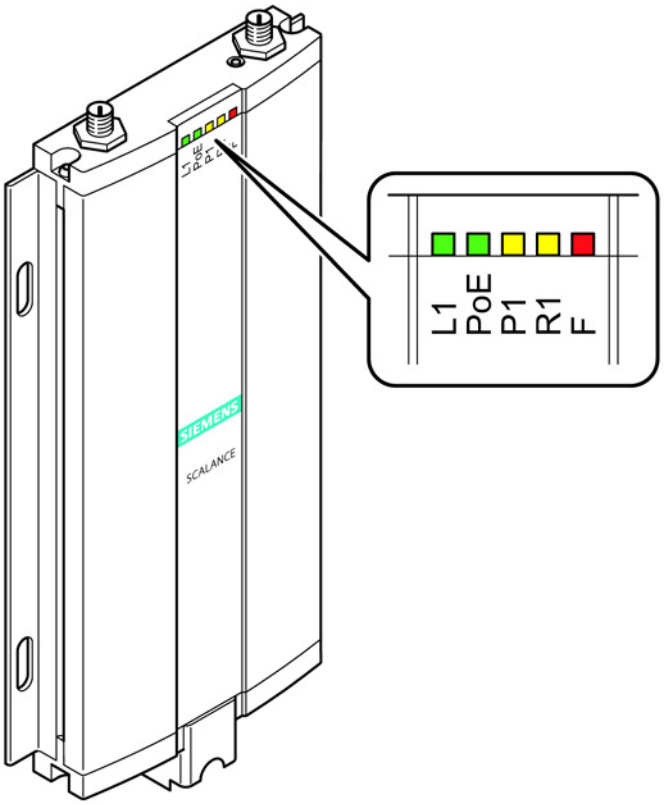


Figure 4-1 LEDs of the SCALANCE W784-1xx / W74x-1

LED	Color	Meaning
L1	Green	Power supply over the 18 - 32 V DC connector.
PoE	Green	Power supply using Power over Ethernet.
P1	Yellow	Data transfer over the Ethernet interface (traffic).
	Green	There is a connection over the Ethernet port. (Link).
	Flashing yellow	PRESET-PLUG detected.
	Yellow/green	PRESET function completed successfully.
	Flashing green	"Flashing" enabled over PST.
R1	Yellow	Data transfer over the WLAN interface.
	Green	*W784-1xx in access point mode:* The WLAN interface is initialized and ready for operation. *W784-1xx in client mode or W74x-1:* There is a connection over the WLAN interface.
	Flashing green	*W784-1xx in access point mode:* The channels are being scanned. *W784-1xx in client mode or W74x-1:* The client is searching for a connection to an access point or ad hoc network.
	Green flashing quickly	*W784-1xx in access point mode:* With 802.11h, the channel is scanned for one minute for primary users before the channel can be used for data traffic. *W784-1xx in client mode or W74x-1:* The client waits for the adopt MAC address due to the setting <Auto Find Adopt MAC> and is connected to no access point.
	Green 3x fast, 1x long flashing	*W784-1xx in client mode or W74x-1:* The client waits for the adopt MAC address due to the setting <Auto Find Adopt MAC> and is connected to an access point.
	Flashing yellow	PRESET-PLUG detected.
	Yellow/green	PRESET function completed successfully.
F	Red	An error occurred during operation with the device.
	Flashing red	Ready to load firmware. The device was either stopped with the reset button or there is incorrect firmware on the device.
	Flashing red, R1 flashing green at the same time	A primary user was found on all enabled channels.

Note

If the LED for the WLAN port is not green when the device starts up, although it is activated, the port is not ready for operation (interface not initialized).

The main reason for this is usually that during commissioning of the SCALANCE W784-1xx / W74x-1 products, a waiting time of up to 15 minutes can occur when the ambient temperature is below zero. The device is ready for operation at the specified ambient temperature as soon as the LED for the WLAN interface is lit green.

Note

Primary user (radar) on all enabled channels

If the device detects a primary user on all enabled channels (for example radio waves of a radar station), the LEDs **F** and **R1** flash. No data traffic is then possible for the next 30 minutes. After this time, the device runs the scan again and checks whether a primary user still exists. If no primary user is detected, data traffic is possible again.

The wait time of 30 minutes is necessary due to legal requirements and cannot be shortened even by resetting the device.

4.3 Reset button

Functions of the reset button

The reset button is located on the top of the housing beside the right-hand socket for external antennas:

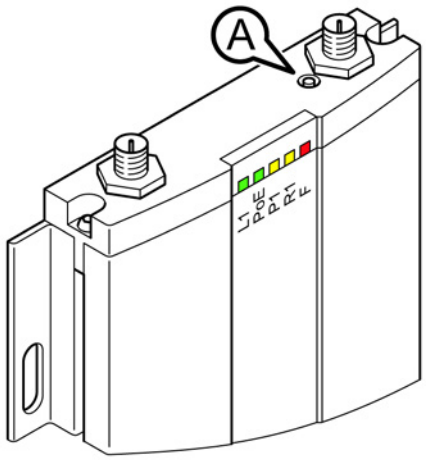


Figure 4-2 Reset button (position A) on the top of the housing of the SCALANCE W784-1xx / W74x-1

The reset button has the following functions:

- **Restart of the device**

  To restart the device, press the reset button.

- **Loading new firmware**

  If the normal procedure with the Load & Save menu of Web Based Management was completed successfully, the reset button can be used to load new firmware. This situation can occur if there was a power outage during the normal firmware update.

- **Restoring the default parameters (factory defaults)**
- **Adopting the configuration data from the PRESET PLUG.**

Mounting 5

5.1 Notes on operating the device in a hazardous area

⚠ WARNING

EXPLOSION HAZARD

When used in hazardous environments corresponding to Class I, Division 2 or Class I, Zone 2, the device must be installed in a cabinet or a suitable enclosure.

⚠ WARNING

Requirements for the cabinet/enclosure

To comply with EU Directive 94/9 (ATEX95), this enclosure must meet the requirements of at least IP54 in compliance with EN 60529.

5.2 Mounting without an adapter (wall mounting only)

Grounding terminal

⚠ WARNING

To operate the SCALANCE W784 safely, the housing must make contact with a chassis ground cable. Do not use the SCALANCE W784 without a ground cable connected.

The ground cable can be connected to one of the securing screws. In this case, use a toothed washer or cutting disk between the housing and the ground cable because the housing is anodized and this is the only way to establish a good conductive connection between the ground cable and housing.

Drilling template and procedure

Note

Installation location

There are no restrictions regarding the installation location for the device.

Antennas, in particular directional antennas, must be mounted in keeping with their characteristics (refer to the technical specifications of the antenna --> Radiation pattern diagrams).

The location of the holes for mounting the SCALANCE W784-1xx / W74x-1 on a wall is shown in the following figure:

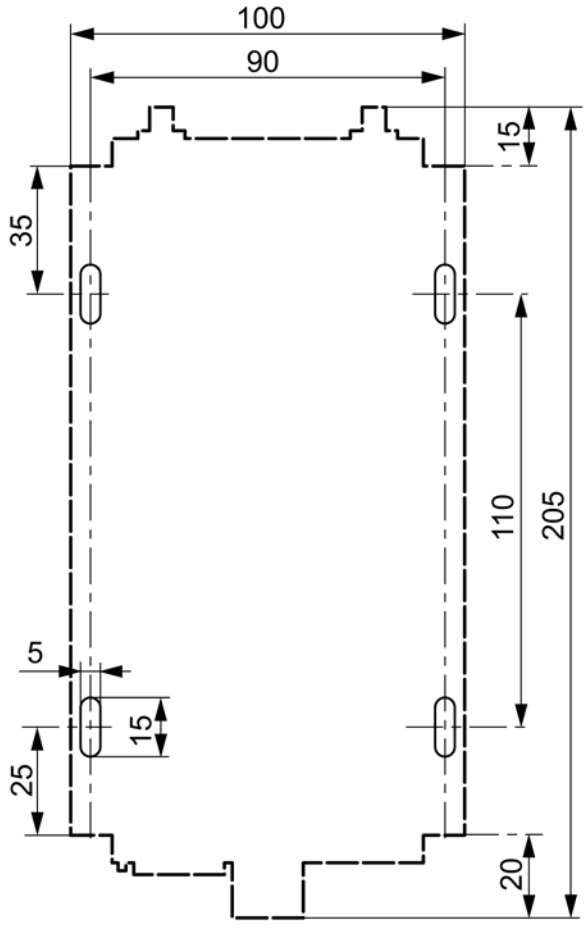


Figure 5-1 Drilling template for wall mounting of a SCALANCE W784-1xx / W74x-1

Secure the SCALANCE W784-1xx / W74x-1 to the wall using four screws. The screws are not supplied with the device. The type and length of the screws depend on the type of wall.

Note

The minimum clearance between the SCALANCE W784-1xx / W74x-1 and fluorescent lamps should be 0.5 m.

5.3 Mounting with adapter plate

5.3.1 Mounting the SCALANCE W784-1xx / W74x-1 on an adapter plate

Notes on operating the device in a hazardous area

⚠ WARNING

EXPLOSION HAZARD

When used in hazardous environments corresponding to Class I, Division 2 or Class I, Zone 2, the device must be installed in a cabinet or a suitable enclosure.

⚠ WARNING

Requirements for the cabinet/enclosure

To comply with EU Directive 94/9 (ATEX95), this enclosure must meet the requirements of at least IP54 in compliance with EN 60529.

Grounding terminal

⚠ WARNING

To operate the SCALANCE W784 safely, the housing must make contact with a chassis ground cable. Do not use the SCALANCE W784 without a ground cable connected.

The ground cable can be connected to one of the securing screws. In this case, use a toothed washer or cutting disk between the housing and the ground cable because the housing is anodized and this is the only way to establish a good conductive connection between the ground cable and housing.

Procedure

Note

Installation location

There are no restrictions regarding the installation location for the device.

Antennas, in particular directional antennas, must be mounted in keeping with their characteristics (refer to the technical specifications of the antenna --> Radiation pattern diagrams).

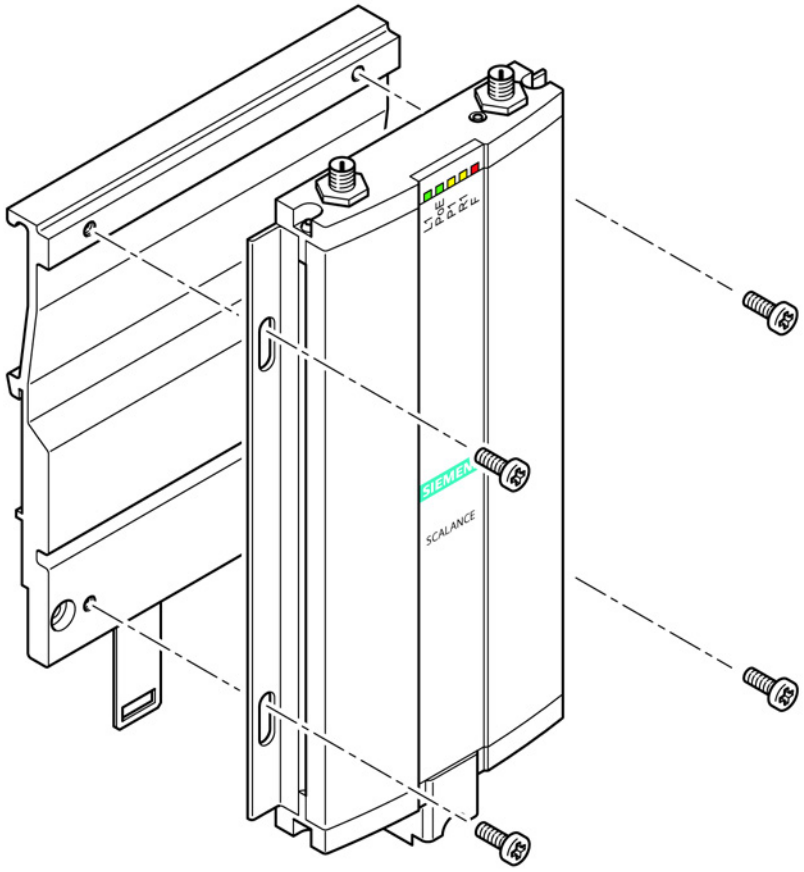


Figure 5-2 Screwing the SCALANCE W784-1xx / W74x-1 to an adapter plate

Screw the SCALANCE W784-1xx / W74x-1 to the plate using the four M4 screws supplied with the adapter plate. The maximum tightening torque for these screws is 0.7 Nm.

5.3.2 Fitting the adapter plate to an S7-300 standard rail

Procedure

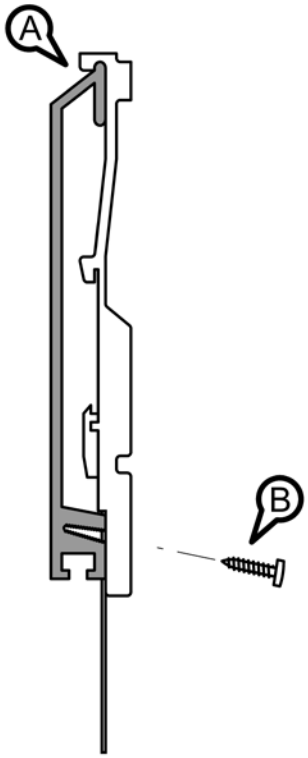


Figure 5-3 Side view of an S7-300 standard rail (shown in gray) with an adapter plate fitted

Note

For cabinet installation, we recommend that you do not install relays on the same or on directly neighboring mounting rails

Follow the steps below to fit the adapter plate to an S7-300 standard rail:

1. Place the adapter plate on the upper edge of the S7-300 standard rail (position **A** in the figure above).
2. At the bottom of the adapter plate, there are two holes with recesses. Use these holes to screw the adapter plate to the S7-300 standard rail. The required screws (position **B** in the figure above) are supplied with the adapter plate.

   The threaded holes at the bottom of the adapter plate are not suitable for screwing the plate to the S7-300 standard rail.

5.3.3 Mounting the adapter plate on a 35 mm DIN rail

Procedure

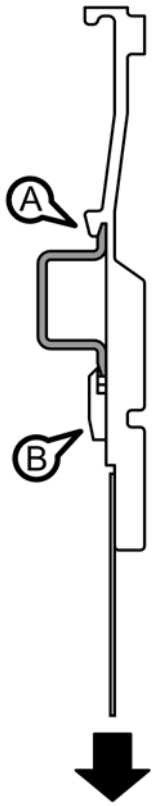


Figure 5-4 Side view of a DIN rail (shown in gray) with an adapter plate fitted

Note

For cabinet installation, we recommend that you do not install relays on the same or on directly neighboring mounting rails

Follow the steps below to fit the adapter plate to a DIN rail:

1. Place the adapter plate on the upper edge of the DIN rail (position A in the figure above).
2. Pull down the DIN rail sliding catch (position B in the figure above) and press the adapter plate against the DIN rail until the sliding catch engages.

Connecting up

6

6.1 Lightning protection, power supply, and grounding

Notes on lightning protection

⚠ WARNING

Danger due to lightning strikes

Antennas installed outdoors must be within the area covered by a lightning protection system. Make sure that all conducting systems entering from outdoors can be protected by a lightning protection potential equalization system.

When implementing your lightning protection concept, make sure you adhere to the VDE 0182 or IEC 62305 standard.

Suitable lightning conductors are available in the range of accessories of SIMATIC NET Industrial WLAN:

Lightning protector LP798-2N (order no. 6GK5798-2LP10-2AA6 is the most suitable version)

Lightning protector LP798-1N (order no. 6GK5798-2LP00-2AA6)

⚠ WARNING

Danger due to lightning strikes

Installing one of these lightning protectors between an antenna and a SCALANCE W-700 is not adequate protection against a lightning strike. The LP798-2N and LP798-1N lightening protectors only work within the framework of a comprehensive lightning protection concept. If you have questions, ask a qualified specialist company.

Note

The requirements of EN61000-4-5, surge immunity tests on power supply lines, are met only when a Blitzductor is used with 12 - 24 V DC and 48 V DC:

12 - 24 V DC: VT AD 24V type no. 918 402

48 V DC:
BXT ML2 BD S48, Part no. 920245
BXT BAS, Part no. 920300 (base)

Manufacturer: DEHN+SÖHNE GmbH+Co.KG, Hans Dehn Str. 1, Postfach 1640, D - 92306 Neumarkt, Germany

Note

48 V lightning protector

When using the 48 V DC lightning protector, the power supply must be fused with 1 A.

Safety extra low voltage

⚠ WARNING

Danger to life from overvoltage, fire hazard

The equipment is designed for operation with Safety Extra Low Voltage, SELV by a Limited Power Source, LPS. (This does not apply to 100 V ... 240 V devices.)

This means that only Safety Extra Low Voltage (SELV) with Limited Power Source, LPS complying with EN60950 / EN 60950-1 / VDE0805 must be connected to the power supply terminals. The power supply unit for the equipment power supply must comply with NEC Class 2, as described by the National Electrical Code (r) (ANSI / NFPA 70).

If the equipment is connected to a redundant power supply (two separate power supplies), both must meet these requirements.

Exception:

Power supply with PELV (according to VDE 0100-410 or IEC 60364-4-41) is also possible if the generated rated voltage does not exceed the voltage limits 25 V AC or 60 V DC.

⚠ WARNING

Take measures to prevent transient voltage surges of more than 40% of the rated voltage. This is the case if you only operate devices with SELV (safety extra-low voltage).

Redundant power supply

NOTICE

Setup with redundant power supply (Power over Ethernet + 24 V DC or 48 V DC)

To use a redundant 24 V power supply (or 48 V with SCALANCE W786) and Power over Ethernet (PoE), a separate floating 24 V source (or 48 V source for W786) must be available for each SCALANCE W-700. Otherwise there is no longer isolation of the input voltages of different devices required for the PoE function and functionality may be disturbed.

Power supply without power grid

To operate the device without a connection to the power grid, you can use a solar panel. The company Solis Energy (www.solisenergy.com) offers suitable solutions. The size of the panel required depends on the daily hours of sunlight. The manufacturer provides assistance in selecting the panel. The solar solution must be designed for 15 watts.

Grounding

NOTICE

Damage to the device due to potential differences

To fully eliminate the influence of electromagnetic interference, the device must be grounded. There must be no potential difference between the following parts, otherwise the device or other connected device could be severely damaged:

- Housing of the SCALANCE W-700 and the ground potential of the antenna.
- Housing of the SCALANCE W-700 and the ground potential of a device connected over Ethernet.
- Housing of the SCALANCE W-700 and the shield contact of the connected Ethernet cable.

Connect both grounds to the same foundation earth or use an equipotential bonding cable.

Interruption of the power supply

NOTICE

Damage to the Ethernet interface

Repeated fast removal and insertion of the Ethernet cable when using Power-over-Ethernet and when there is a redundant power supply can cause damage to the Ethernet interface.

Avoid repeatedly removing and inserting the Ethernet cable when using Power-over-Ethernet and a redundant power supply.

Notes on operating the device in a hazardous area

⚠ WARNING

EXPLOSION HAZARD

DO NOT CONNECT OR DISCONNECT EQUIPMENT WHEN A FLAMMABLE OR COMBUSTIBLE ATMOSPHERE IS PRESENT.

⚠ WARNING
EXPLOSION HAZARD
SUBSTITUTION OF COMPONENTS MAY IMPAIR SUITABILITY FOR CLASS I, DIVISION 2 OR ZONE 2.

⚠ WARNING
EXPLOSION HAZARD
DO NOT OPEN WHEN ENERGIZED.

Special notes for the SCALANCE W786-xPRO/RR

Warning Notices cULus haz.loc.

This equipment is suitable for use in Class I, Division 2, Groups A, B, C, D; Class I, Zone 2, Group IIC or non-hazardous locations.

WARNING - Cat. Nos. EAP-Wx-yy-zx (US installation only):

- PLTC cable type and manufacturer shall be specified: Listed (QPTZ), Type 5240U1 (Waterdog PLTC-ER) manufactured by Belden.

- The PLTC cable for the power supply must be installed in a manner to avoid tensile stress at the termination fittings in accordance with Article 501.10 (B)(1)(4) of the NEC.

- The PLTC cable for the power supply must be installed in accordance with Article 725.154 (D)(1) through (D)(4) of the NEC.

WARNING -Cat. Nos. EAP-Wx-yy-zx (Canadian installation only):

- TC cable type and manufacturer shall be specified: Listed (QPOR), Type JZ-604 TC manufactured by Helukabel GmbH.

- The TC cable for the power supply must be installed in areas of industrial establishments that are inaccessible to the public and in a manner that meets the requirements in Rule 12-2202(2) of the CEC:
Installed in conduit, other suitable raceway, or direct buried, when not in cable tray. Provided with mechanical protection where subject to damage either during or after installation.
Installed only where qualified persons service the installation.

When operated in potential hazardous areas:

WARNING - Explosion Hazard – Do not disconnect while circuit is live unless area is known to be non-hazardous

6.2 Suitable antenna cables and antennas for SCALANCE W-700

Antenna connector: N-Connect/R-SMA connecting cable

The N-Connect/R-SMA male/male flexible connecting cable is available as an accessory for direct connection of an antenna to a SCALANCE W-700.

Length in m	Order number
1	6XV1875-5CH10
2	6XV1875-5CH20
5	6XV1875-5CH50
10	6XV1875-5CN10

Antenna connector: N-Connect/ N-Connect connecting cable

The N-Connect/N-Connect male/male flexible connecting cable is available as an accessory for connecting an antenna to the lightning protector LP798-1N.

Length in m	Order number
1	6XV1875-5AH10
2	6XV1875-5AH20
5	6XV1875-5AH50
10	6XV1875-5AN10

There is a control cabinet feedthrough available for IWLAN devices located in a control cabinet. You will find detailed information in the catalog IK PI.

Antennas

The following antennas have been approved for use with a SCALANCE W-700:

Type	Properties	Order no.
ANT795-6MN	Omni antenna 2.4 / 5 GHz, ceiling mounted	6GK5795-6MN00-0AA6
ANT792-6MN	Omni antenna 2.4 GHz, wall mounted	6GK5792-6MN00-0AA6
ANT793-6MN	Omni antenna 5 GHz, wall mounted	6GK5793-6MN00-0AA6
ANT792-8DN	Directional antenna 2.4 GHz, wall mounted	6GK5792-8DN00-0AA6
ANT793-8DN	Directional antenna 5 GHz, wall mounted	6GK5793-8DN00-0AA6
ANT795-6DN	Directional antenna 2.4 / 5 GHz, wall mounted	6GK5795-6DN00-0AA6

Type	Properties	Order no.
ANT795-4MR	Omni antenna 2.4 / 5 GHz, mounted directly on a SCALANCE W788-xPRO/RR or W74x-1PRO/RR	6GK5795-4MR00-0AA6
ANT795-4MS	Omni antenna 2.4 / 5 GHz, mounted directly on a SCALANCE W788-xPRO/RR or W784-1xx or W74x-1PRO/RR or W74x-1	6GK5795-4MS00-0AA6
ANT792-4DN	RCoax antenna 2.4 GHz	6GK5792-4DN00-0AA6
ANT793-4MN	RCoax antenna 5 GHz	6GK5793-4MN00-0AA6

NOTICE

ANT795-4MS

The ANT795-4MS antenna has degree of protection IP30 and is therefore suitable for a dry environment.

6.3 Connectors for the power supply of the SCALANCE W784-1xx / W74x-1

Possible power supplies

The following power supplies are suitable for the SCALANCE W784-xx / W74x-1:

- 24 VDC or 48 VDC direct voltage
- Power over Ethernet (PoE)
  If an eight-wire Ethernet cable is used, it is possible to supply power over the four wires that are not used as data lines. As an alternative, the voltage can be modulated onto the data lines ("phantom power")
  If a Fast Connect Ethernet connector is used to allow cable assembly in the field and due to its greater mechanical strength, you can only use four-wire cables. In this case, only phantom power is possible.

Procedure for connecting the supplied connector

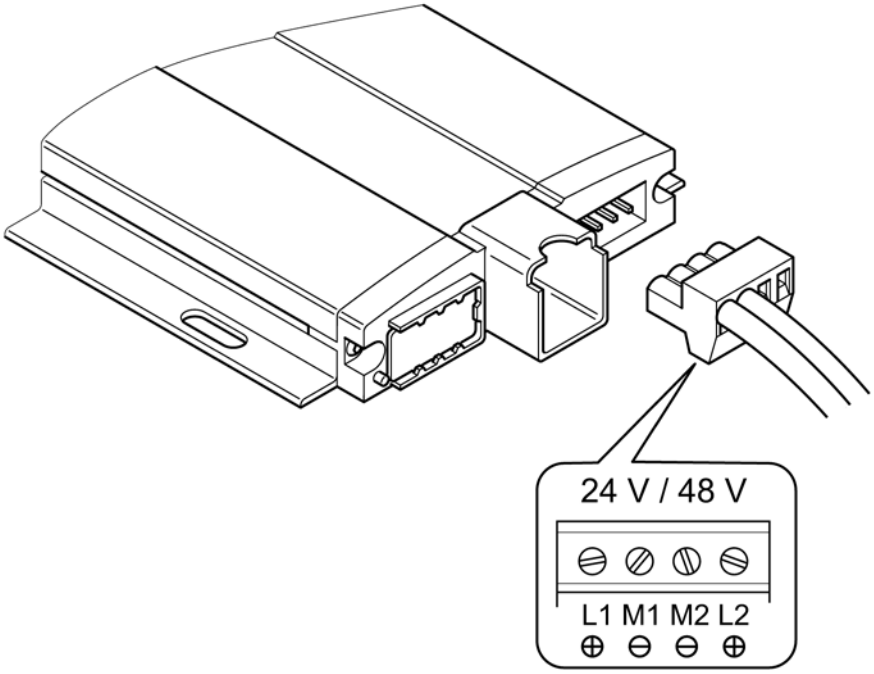


Figure 6-1 Connector for the power supply of the SCALANCE W784-1xx / W74x-1. The screw terminal is located as shown on the rear of the connector.

Perform the following steps to connect a power supply cable to a SCALANCE W784-1xx / W74x-1:

1. Connect the supplied connector to the power supply cable. The figure above shows the location of the socket in the housing and the contact assignment. The connector is protected against polarity reversal. When connecting the wires, make sure that the connector is oriented correctly.
2. Press the connector into the socket in the housing until it engages.
3. Make sure that there is suitable strain relief for the power cable.

6.4 Connection for Industrial Ethernet

Ethernet connector on the base of the housing

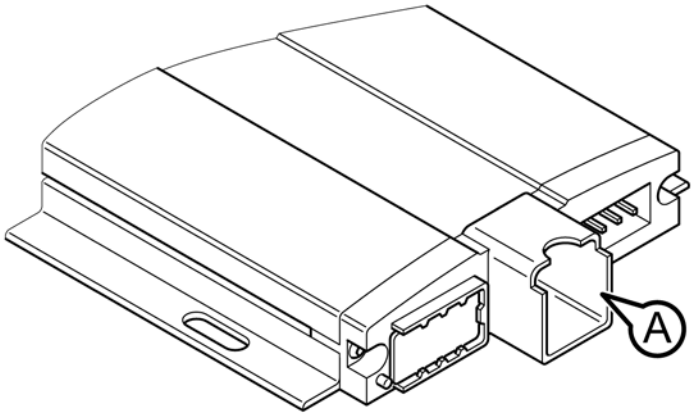


Figure 6-2 Connector for Industrial Ethernet on a SCALANCE W784-1xx / W74x-1

The Ethernet connector is located on the underside of the SCALANCE W784-1xx / W74x-1 (position A in the figure above)

Insert the Ethernet connector into this jack until it locks in place. Make sure that there is suitable strain relief for the Ethernet cable.

6.5 Connectors for external antennas

How to connect antennas

Note

The distance between the antennas of the various WLAN interfaces must be at least 1 m.

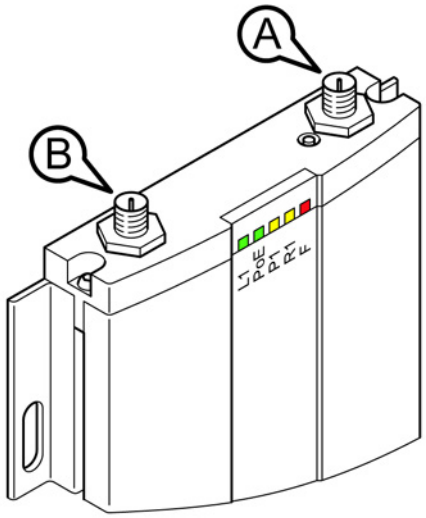


Figure 6-3 Connectors for external antennas on the top of a SCALANCE W784-1xx / W74x-1

The figure above shows the location of the antenna sockets "A" and "B". Perform the following steps to connect a cable for an external antenna to a SCALANCE W784-1xx / W74x-1:

1. Insert the connector on the antenna cable into the R-SMA socket and tighten the sleeve nut on the socket (key size SW8). The maximum tightening torque is 0.6 Nm.
2. Screw a terminating resistor to the unused socket if you are only using one antenna.

6.6 Inserting / removing the C-PLUG

Inserting the C-PLUG

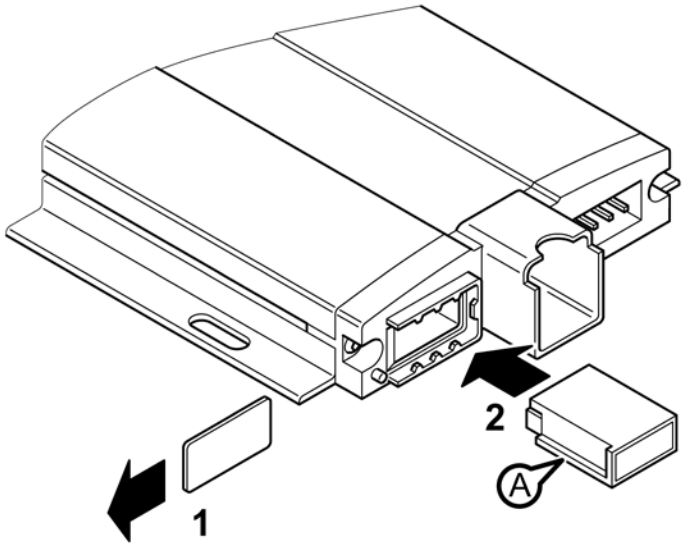


Figure 6-4 Inserting a C-PLUG in a W784-1xx / W74x-1

Follow the steps below to insert a C-PLUG in a SCALANCE W784-1xx / W74x-1:

1. Remove the cover of the slot.
2. The housing of the C-PLUG has a protruding long edge (position A). The C-PLUG can only be inserted as shown in the figure above. The slot has a groove at this position. Insert the C-PLUG into the slot.
3. Close the slot with the cover.

Removing the C-PLUG

1. Remove the cover of the slot.
2. Insert a screwdriver between the left-hand front edge of the C-PLUG and the slot and release the C-PLUG. Remove the C-PLUG
3. Close the slot with the cover.

Technical specifications 7

7.1 Technical specifications of the SCALANCE W784-1xx / W74x-1

Device variants

The technical specifications apply to the following products:

- SIMATIC NET SCALANCE W784-1
- SIMATIC NET SCALANCE W784-1RR
- SIMATIC NET SCALANCE W744-1
- SIMATIC NET SCALANCE W746-1
- SIMATIC NET SCALANCE W747-1

Data transfer

Ethernet transfer rate	10/100 Mbps
Wireless transmission rate	1 ... 54 Mbps (108 Mbps)
Wireless standards supported	802.11a 802.11b 802.11g 802.11h
Power supply standards supported	802.3af (Power over Ethernet)

Interfaces

Power	• Rated voltages 24 V DC or 48 V DC safety extra-low voltage (SELV) (minimum permitted voltage 18 V DC, maximum permitted voltage 57 V DC) • RJ-45 jack Power over Ethernet 48 V DC (minimum permitted voltage 36 V DC, maximum permitted voltage 57 V DC) Power supply isolated according to IEEE 802.3af, isolation resistance > 2 Mohms.
Data	• RJ-45 jack for Ethernet • 2 R-SMA antenna sockets

Electrical data

Power consumption	6 W

Design of the SCALANCE W784

Dimensions without antennas and adapter plate (W x H x D)	100 mm x 205 mm x 20 mm
Weight	approx. 291 g

Design of the adapter plate

Dimensions without DIN rail slider (W x H x D)	120 mm x 129 mm x 15 mm
Material of the adapter plate	Aluminum
Material of the DIN rail slider	Stainless steel
Weight	approx. 256 g

Permitted ambient conditions

Operating temperature	-20°C to 60°C
Transportation/storage temperature	-40°C to 70°C
Degree of protection	Tested to IP30

MTBF information (mean time between failure)

MTBF	67 years

Transmit power

Table 7- 1 Transmit power in IEEE 802.11b mode (2.4 GHz)

Data rate [Mbps]	P_0 [dBm]
1	20
2	20
5.5	20
11	20

Table 7- 2 Transmit power in IEEE 802.11g mode (2.4 GHz)

Data rate [Mbps]	P_0 [dBm]
6	17
9	17
12	17
18	17
24	17
36	17
48	17
54	16

Table 7- 3 Transmit power in IEEE 802.11a/h mode (5 GHz)

Data rate [Mbps]	P_0 [dBm]
6	17
9	17
12	17
18	17
24	17
36	16
48	15
54	13.5

Receiver sensitivity

Table 7- 4 Receiver sensitivity in IEEE 802.11b mode (2.4 GHz)

Data rate [Mbps]	P_e [dBm]
1	-98
2	-94
5.5	-92
11	-90

Table 7- 5 Receiver sensitivity in IEEE 802.11g mode (2.4 GHz)

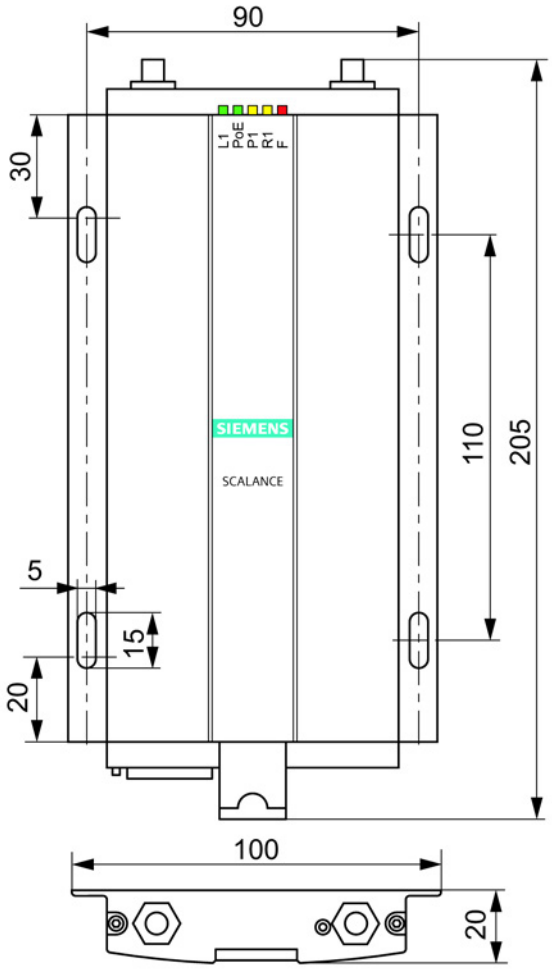
Data rate [Mbps]	P_e [dBm]
6	-93
9	-92
12	-91
18	-88
24	-85
36	-82
48	-77
54	-76

Table 7- 6 Receiver sensitivity in IEEE 802.11a/h mode (5 GHz)

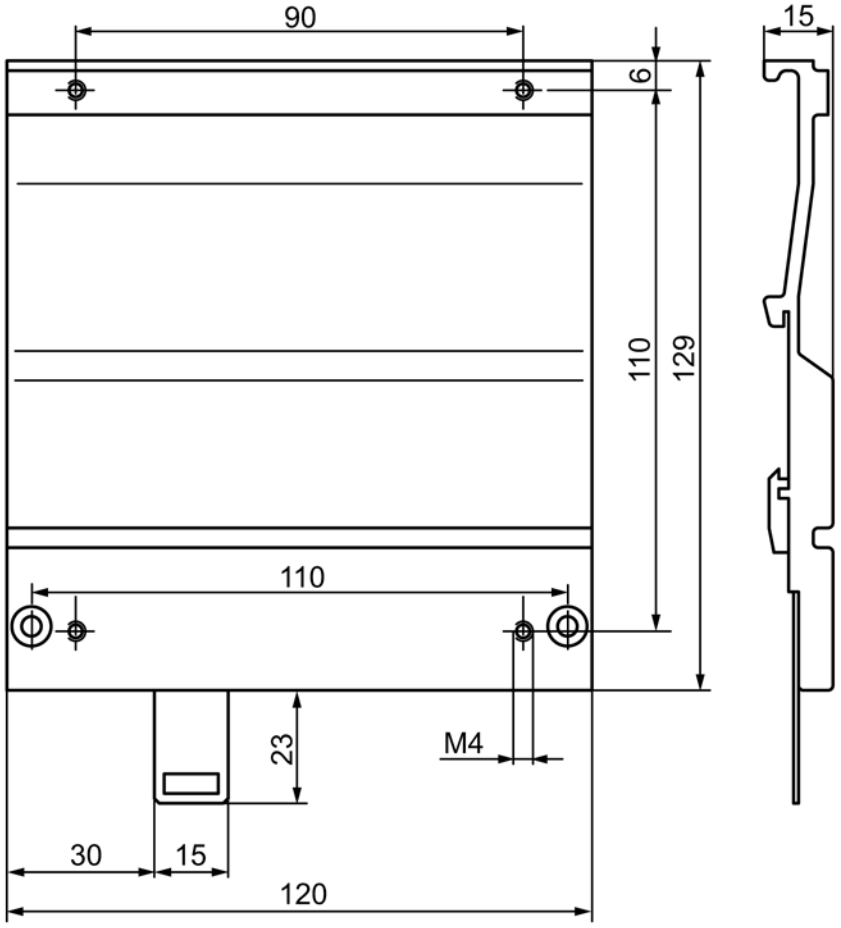
Data rate [Mbps]	P_e [dBm]
6	-90
9	-89
12	-88
18	-86
24	-83
36	-80
48	-75
54	-74

7.2 Dimension drawing SCALANCE W784

Front view and view from above of the SCALANCE W784



Front view and side view of the adapter plate



7.3 Permitted antennas

Accessories for SCALANCE W-700

Note

When you select an antenna, keep in mind the national approvals for your SCALANCE W7xx.

Characteristics	Type	Frequency / GHz	Antenna gain / dBi	Impedance / Ω	Order No.
Omni	ANT795-6MN	2.4	6	50	6GK5795-6MN00-0AA6
		5	8		
Omni	ANT792-6MN	2.4	6	50	6GK5792-6MN00-0AA6
Omni	ANT793-6MN	5	5	50	6GK5793-6MN00-0AA6
Patch	ANT795-6DN	2.4	9	50	6GK5795-6DN00-0AA6
		5	9		
Directional antenna	ANT792-8DN	2.4	14	50	6GK5792-8DN00-0AA6
Directional antenna	ANT793-8DN	5	18	50	6GK5793-8DN00-0AA6
Helix (for RCoax)	ANT792-4DN	2.4	4	50	6GK5792-4DN00-0AA6
λ5/8 (for RCoax)	ANT793-4MN	5	6		6GK5793-4MN00-0AA6
RCoax	IWLAN RCoax PE 1/2" 2.4 GHz	2.4	0	50	6XV1875-2A
RCoax	IWLAN RCoax PE 1/2" 5 GHz	5	0	50	6XV1875-2D

Certification

8

8.1 Approvals for SCALANCE W784-1xx / W74x-1

CE conformity

The products

SIMATIC NET SCALANCE W784-1
SIMATIC NET SCALANCE W784-1RR

SIMATIC NET SCALANCE W744-1
SIMATIC NET SCALANCE W746-1
SIMATIC NET SCALANCE W747-1

in the version put into circulation by Siemens AG conform to the regulations of the following European directive:

- 99/5/EC
  Directive of the European Parliament and of the Council on radio equipment and telecommunications terminal equipment and the mutual recognition of their conformity. Conformity with the basic requirement of the directive is attested by adherence to the following standards:
- EN 60950-01
  Information technology equipment - Safety - Part 1: General requirements
- EN 301489-1 V1.9.2
  Electromagnetic compatibility and radio spectrum matters (ERM) - Electromagnetic compatibility for radio equipment and services - Part 1 : Common technical requirements (V1.9.2)
- EN 301489-17 V2.2.1
  Electromagnetic compatibility and radio spectrum matters (ERM) - Electromagnetic compatibility for radio equipment and services - Part 17: Specific conditions for 2.4 GHz broadband transmission systems and 5 GHz high performance RLAN equipment
- EN 300328 V1.7.1
  Electromagnetic Compatibility and Radio Spectrum Matters (ERM); — Broadband transmission systems — Data transmission equipment operating in the 2.4 GHz ISM band and using spread spectrum modulation techniques — Harmonized EN covering essential requirements under article 3.2 of the R&TTE Directive
- EN 301893 V1.7.1
  Broadband Radio Access Networks (BRAN) - 5 GHz high performance RLAN - Harmonized EN covering essential requirements of article 3.2 of the R&TTE Directive

- EN 50385
  Product Standard to Demonstrate the Compliance of Radio Base Stations and Fixed Terminal Stations for Wireless Telecommunication Systems with the Basic Restrictions or the Reference Levels Related to Human Exposure to Radio-Frequency Electromagnetic Fields (110 MHz to 40 GHz) - General Public
- 1999/519/EC
  Council recommendation on the limitation of exposure of the general public to electromagnetic fields (0 Hz to 300 GHz)

Devices connected to the system must meet the relevant safety regulations.

The EC Declaration of Conformity is available for the responsible authorities according to the above-mentioned EC Directive at the following address:

Siemens Aktiengesellschaft
Industry Sector
Postfach 4848
D-90026 Nürnberg

This declaration certifies compliance with the directives named above, but does not guarantee any specific properties.

Note

The specified approvals apply only when the corresponding mark is printed on the product.

ATEX, cULus and FM approvals

The products

SIMATIC NET SCALANCE W784-1
SIMATIC NET SCALANCE W784-1RR

SIMATIC NET SCALANCE W744-1
SIMATIC NET SCALANCE W746-1
SIMATIC NET SCALANCE W747-1

have the following approvals

- EN 60079-15:2005
  EN 60079-0:2006
  II 3 G Ex nA II T..
  KEMA 07 ATEX 0145X
- c-UL-us:
  UL 60950-1 CSA C22.2 No. 60950-1
- c-UL-us for hazardous location*:
  ISA 12.12.01-2000, CSA C22.2 No. 213-M1987
  CL. 1, Div. 2 GP. A.B.C.D T..
  CL. 1, Zone 2, GP, IIC, T..
  CL. 1, Zone 2, AEx nC IIC T..
- FM 3611 Hazardous (Classified) Location Electrical Equipment:
  Non Incendive / Class I / Division 2 / Groups A,B,C,D / T* and
  Non Incendive / Class I / Zone 2 / Group IIC / T*

(T.. / T* = For detailed information on the temperature class, refer to the type plate)

Other approvals

The products

SIMATIC NET SCALANCE W784-1
SIMATIC NET SCALANCE W784-1RR

SIMATIC NET SCALANCE W744-1
SIMATIC NET SCALANCE W746-1
SIMATIC NET SCALANCE W747-1

meet the stipulations of the following directives or standards:

- Directive 72/245/EC, last changed by directive 2006/28/EC
  Type approval number e1*72/245*2006/28*5329*00
  E1: Number of the approval 035329, extension no. 01
- EN 50155 (VDE 0115 Part 200, March 2008)

Note

The specified approvals apply only when the corresponding mark is printed on the product.

Certification ID

The following table shows the product names and the corresponding certification ID:

Type	Number of supported IP nodes	Number of supported MAC nodes	iPCF mode	Certification ID Order no. Order no. US variant
W784-1	Multiple	Multiple	No	**LAP-W1-RJ-E1** 6GK5784-1AA30-2AA0 6GK5784-1AA30-2AB0
W784-1RR	Multiple	Multiple	Yes	**LAP-W1-RJ-E1** 6GK5784-1AA30-6AA0 6GK5784-1AA30-6AB0
W744-1	1	1	No	**LAP-W1-RJ-E1** 6GK5744-1AA30-2AA0 6GK5744-1AA30-2AB0
W746-1	8	8	No	**LAP-W1-RJ-E1** 6GK5746-1AA30-4AA0 6GK5746-1AA30-4AB0
W747-1	8	8	Yes	**LAP-W1-RJ-E1** 6GK5747-1AA30-6AA0 6GK5747-1AA30-6AB0

SIEMENS

Declaration of Conformity

Manufacturer / responsible person	Alfred Hümmer
Address:	Siemens AG I IA SC CI Gleiwitzer Str. 555 90475 Nuremberg Germany

Declares that the product:

type:	Industrial WLAN Access Point LAP Family
model:	**LAP-W1-RJ-E1**
Intended use	Wireless Communication

Complies with the essential requirements of Article 3 of the R&TTE 1999/5/EC Directive, if used for its intended use and that the following standards has been applied:

1. Safety (Article 3.1.a of the R&TTE Directive)

Applied standard(s)	issue
EN 60950-1	**2006 + A11: 2009 + A1:2010 + A12:2011 + AC:2011**

2. Electromagnetic compatibility (Article 3.1.b of the R&TTE Directive)

Applied standard(s)	issue
EN 301489-1 V1.9.1	**2011-04**
EN 301489-17 V2.2.1	**2012-09**

3. efficient use of the radio frequency spectrum (Article 3.2 of the R&TTE Directive)

Applied standard(s)	issue
EN 300 328 V1.7.1	**2006-10**
EN 301 893 V1.7.1	**2012-06**

4. Health (Article 3.1a of the R&TTE Directive)

Applied standard(s)	issue
EN 50385	**2002**
1999/519/EC	

Siemens Aktiengesellschaft

Nuremberg, 05 June 2013
(Place and Date)

i.A. Thomas Grötschel

i.V. Alfred Hümmer

FCC approval

This device complies with Part 15 of the FCC Rules.

Operation is subject to the following two conditions:

(1) this device may not cause harmful interference, and
(2) this device must accept any interference received, including interference that may cause undesired operation.

Notice

Changes or modifications made to this equipment not expressly approved by SIEMENS may void the FCC authorization to operate this equipment.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Notice

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20 cm between the radiator and your body.

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

Professional Installation Notice:

To comply with FCC part 15 rules in the United States, the system must be professionally installed to ensure compliance with the Part 15 certification. It is the responsibility of the operator and professional installer to ensure that only certified systems are deployed in the United States. The use of the system in any other combination (such as co-located antennas transmitting the same information) is expressly forbidden.

Note

In the USA, the "ANT793-8DN" antenna is approved only for wireless mode 802.11a!

Note

The specified approvals apply only when the corresponding mark is printed on the product.

RSS-210 of Industry Canada

"Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device."

"This device has been designed to operate with the antennas listed below*, and having a maximum gain of 18 dBi. Antennas not included in this list or having a gain greater than 18 dBi are strictly prohibited for use with this device. The required antenna impedance is 50 ohms."

"To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the equivalent isotropically radiated power (e.i.r.p.) is not more than that permitted for successful communication."

"That the device for the band 5150-5250 MHz is only for indoor usage to reduce potential for harmful interference to co-channel mobile satellite systems."

"Users should also be cautioned to take note that high power radars are allocated as primary users (meaning they have priority) of 5250-5350 MHz and 5650-5850 MHz and these radars could cause interference and/or damage to LE-LAN devices."

* For more detailed information on the approved antennas, refer to the section "Technical specifications".

Note

In Canada, the "ANT793-8DN" antenna is approved only for wireless mode 802.11a!

Note

The specified approvals apply only when the corresponding mark is printed on the product.

NCC Warning Statement (Taiwan)

Article 12
Without permission, any company, firm or user shall not alter the frequency, increase the power, or change the characteristics and functions of the original design of the certified lower power frequency electric machinery.

Article 14
The application of low power frequency electric machineries shall not affect the navigation safety nor interfere a legal communication, if an interference is found, the service will be suspended until improvement is made and the interference no longer exists.

Note

The "ANT793-8DN" antenna is not approved in Taiwan!

Note

The specified approvals apply only when the corresponding mark is printed on the product.

KCC Statement (Republic of Korea)

사용자안내문(제5조제1항제1호관련)

기 종 별	사 용 자 안 내 문
A 급 기기 (업무용 방송통신기기)	이 기기는 업무용(A 급)으로 전자파적합등록을 한 기기이오니 판매자 또는 사용자는 이 점을 주의하시기 바라며, 가정외의 지역에서 사용하는 것을 목적으로 합니다.

"당해 무선설비는 전파혼신 가능성이 있으므로 인명안전과 관련된 서비스는 할 수 없음"

Note

The specified approvals apply only when the corresponding mark is printed on the product.

Notes on approval in Mexico

Certification ID	Certification number
LAP W1-RJ-E1	RCPSILA08-0714

Notes on approval in Argentina

Certification ID	Certification number
LAP W1-RJ-E1	CNC:C-6874

Note on approval in Bahrain

The operator/owner of this device must comply with the 2.4 GHz and 5 GHz Frequency Licensing Regulation and technical specifications, and must also obtain the necessary licenses in order to use these frequencies in accordance with the Telecommunications Law (refer to section 43 and 44).

Note on approval in Brazil

Note

The specified approvals apply only when the corresponding mark is printed on the product.

8.2 National approvals

National approvals

The following table lists the countries in which the SCALANCE W700 product is approved. The diamond symbol (♦) identifies all countries for which there was no approval at the time these operating instructions were written.

The current status of the approvals can be found on the Internet at the following address:

`Http://www.siemens.com/funkzulassungen`

Column	Meaning
Country	Country
Mode	IEEE 802.11 standard and the TPC and / or DFS functionality, where required
CH	Channel
MHz	Frequency
PWR (EIRP)	Maximum permitted effective isotropic radiated power
Use	Permitted use indoors and / or outdoors

Country	Mode	CH	MHz	PWR (EIRP)	Use
Egypt	11b 11g 11g Turbo	1 - 13	2412 - 2472	100 mW	Indoor + outdoor
	11a TPC	36 - 48	5180 - 5240	200 mW	Indoor only
		149 - 165	5745 - 5825	200 mW	Indoor + outdoor
	11h DFS+TPC	52 - 64	5260 - 5320	200 mW	Indoor only
Angola	11b 11g 11g Turbo	1 - 13	2412 - 2472	100 mW	Indoor + outdoor
	11a TPC	36 - 48	5180 - 5240	200 mW	Indoor only
	11h DFS+TPC	36 - 64	5180 - 5320	200 mW	Indoor only
		100 - 116	5500 - 5580	1000 mW	Indoor + outdoor
		132 - 140	5660 - 5700	1000 mW	Indoor + outdoor
Argentina	11b 11g	1 - 13	2412 - 2472	1000 mW	Indoor + outdoor
	11a TPC	52 - 64	5260 - 5320	250 mW	Indoor + outdoor
		149 - 161	5745 - 5805	1000 mW	Indoor + outdoor

Country	Mode	CH	MHz	PWR (EIRP)	Use
Australia	11b 11g 11g Turbo	1 - 13	2412 - 2472	100 mW	Indoor + outdoor
	11a TPC	36 - 64	5180 - 5320	200 mW	Indoor only
		149 - 165	5745 - 5825	1000 mW	Indoor + outdoor
	11a Turbo	42	5210	50 mW	Indoor only
	TPC	50 58	5250 5290	200 mW	Indoor only
		152 160	5760 5800	1000 mW	Indoor + outdoor
Bahrain	11b 11g 11g Turbo	1 - 13	2412 - 2472	100 mW	Indoor + outdoor
	11a TPC	36 - 48	5180 - 5240	200 mW	Indoor only
	11h DFS+TPC	36 - 64	5180 - 5320	200 mW	Indoor only
		149 - 165	5745 - 5825	1000 mW	Indoor + outdoor
Brazil	11b 11g 11g Turbo	1 - 13	2412 - 2472	400 mW	Indoor + outdoor
	11a TPC	36 - 48	5180 - 5240	200 mW	Indoor only
		149 - 165	5745 - 5825	1000 mW	Indoor + outdoor

Country	Mode	CH	MHz	PWR (EIRP)	Use
Chile	11b	1 - 13	2412 - 2472	100 mW	Indoor only
	11h DFS+TPC	36 - 64	5180 - 5320	100 mW	Indoor only
		149 - 165	5745 - 5825	100 mW	Indoor only
	11h Turbo DFS+TPC	42	5210	100 mW	Indoor only
		50 58	5250 5290	100 mW	Indoor only
		152 160	5760 5800	100 mW	Indoor only
China	11b 11g 11g Turbo	1 - 13	2412 - 2472	100 mW	Indoor + outdoor
	11a TPC	149 - 165	5745 - 5825	1000 mW	Indoor + outdoor

Country	Mode	CH	MHz	PWR (EIRP)	Use
Belgium Bulgaria Denmark Germany Estonia Finland France Greece Great Britain Ireland Iceland Italy Latvia Liechtenstein Lithuania Luxembourg Malta Netherlands Norway Austria Poland Portugal Romania Sweden Switzerland Slovakia Slovenia Spain Czech Republic Hungary Cyprus CE	11b 11g 11g Turbo	1 - 13	2412 - 2472	100 mW	Indoor + outdoor
	11a TPC	36 - 48	5180 - 5240	200 mW	Indoor only
	11h DFS+TPC	36 - 64	5180 - 5320	200 mW	Indoor only
		100 - 116	5500 - 5580	1000 mW	Indoor + outdoor
		132 - 140	5660 - 5700	1000 mW	Indoor + outdoor
Hong Kong OFTA 電訊管理局	11b 11g 11g Turbo	1 - 13	2412 - 2472	100 mW	Indoor + outdoor
	11a TPC	36 - 48	5180 - 5240	200 mW	Indoor only
	11h DFS+TPC	36 - 64	5180 - 5320	200 mW	Indoor only
		100 - 116	5500 5580	1000 mW	Indoor + outdoor
		132 - 140	5660 5700	1000 mW	Indoor + outdoor

Country	Mode	CH	MHz	PWR (EIRP)	Use
India	11b 11g	1 - 13	2412 - 2472	100 mW	Indoor + outdoor
	11a TPC	36 - 64	5180 - 5320	200 mW	Indoor only
		149 - 165	5745 - 5825	200 mW	Indoor only
Japan	11b	1 - 14	2412 - 2484	100 mW	Indoor + outdoor
	11g	1 - 13	2412 - 2472	100 mW	Indoor + outdoor
	11a TPC	184 - 196	4920 - 4980	200 mW	Indoor + outdoor
		8 12 16	5040 5060 5080	200 mW	Indoor + outdoor
		36 - 48	5180 - 5240	200 mW	Indoor only
	11h DFS+TPC	100 - 140	5500 - 5700	200 mW	Indoor + outdoor
Canada	11b 11g	1	2412	200 mW	Indoor + outdoor
		2 - 10	2417 - 2457	1000 mW	Indoor + outdoor
		11	2462	200 mW	Indoor + outdoor
	11a TPC	36 - 48	5180 - 5240	200 mW	Indoor only
		149 - 165	5745 - 5825	1000 mW	Indoor + outdoor
	11a Turbo	42	5210	200 mW	Indoor only
	TPC	152 160	5760 5800	1000 mW	Indoor + outdoor
	11h DFS+TPC	52 - 64	5260 - 5320	200 mW	Indoor + outdoor
		100 - 140	5500 - 5700	200 mW	Indoor + outdoor

Country	Mode	CH	MHz	PWR (EIRP)	Use
Colombia	11b 11g	1	2412	200 mW	Indoor + outdoor
		2 - 10	2417 - 2457	1000 mW	Indoor + outdoor
		11	2462	200 mW	Indoor + outdoor
	11a TPC	36 - 48	5180 - 5240	200 mW	Indoor only
		149 - 165	5745 - 5825	1000 mW	Indoor + outdoor
	11a Turbo TPC	152 160	5760 5800	1000 mW	Indoor + outdoor
Croatia	11b 11g 11g Turbo	1 - 13	2412 - 2472	100 mW	Indoor + outdoor
	11a TPC	36 - 48	5180 - 5240	200 mW	Indoor only
	11h DFS+TPC	36 - 64	5180 - 5320	200 mW	Indoor only
		100 - 140	5500 - 5700	1000 mW	Indoor + outdoor
Kuwait	11b 11g 11g Turbo	1 - 13	2412 - 2472	100 mW	Indoor + outdoor
	11a	36 - 48	5180 - 5240	200 mW	Indoor + outdoor
	11h	52 - 64	5260 - 5320	200 mW	Indoor + outdoor
Malaysia	11b 11g	1 - 13	2412 - 2472	100 mW	Indoor + outdoor
	11a TPC	56 60 64	5280 5300 5320	200 mW	Indoor only
		149 - 165	5745 - 5825	1000 mW	Indoor + outdoor

Country	Mode	CH	MHz	PWR (EIRP)	Use
Macedonia	11b 11g 11g Turbo	1 - 13	2412 - 2472	100 mW	Indoor + outdoor
	11a TPC	36 - 48	5180 - 5240	200 mW	Indoor only
	11h DFS+TPC	36 - 64	5180 - 5320	200 mW	Indoor only
		100 - 116	5500 - 5580	1000 mW	Indoor + outdoor
		132 - 140	5660 - 5700	1000 mW	Indoor + outdoor
Mexico	11b 11g 11g Turbo	1 - 11	2412 - 2462	500 mW	Indoor + outdoor
	11a TPC	36 - 48	5180 - 5240	200 mW	Indoor + outdoor
		52 - 64	5260 - 5320	1000 mW	Indoor + outdoor
		149 - 165	5745 - 5825	1000 mW	Indoor + outdoor
	11a Turbo TPC	152 160	5760 5800	1000 mW	Indoor + outdoor
Mozambique	11b 11g 11g Turbo	1 - 13	2412 - 2472	100 mW	Indoor + outdoor
	11a TPC	36 - 48	5180 - 5240	200 mW	Indoor only
	11h DFS+TPC	36 - 64	5180 - 5320	200 mW	Indoor only
		100 - 116	5500 - 5580	1000 mW	Indoor + outdoor
		132 - 140	5660 - 5700	1000 mW	Indoor + outdoor

Country	Mode	CH	MHz	PWR (EIRP)	Use
Peru	11b 11g 11g Turbo	1	2412	200 mW	Indoor + outdoor
		2 - 10	2417 - 2457	1000 mW	Indoor + outdoor
		11	2462	200 mW	Indoor + outdoor
	11a TPC	36 - 48	5180 - 5240	200 mW	Indoor only
		149 - 165	5745 - 5825	1000 mW	Indoor + outdoor
Russia	11b 11g	1 - 13	2412 - 2472	100 mW	Indoor + outdoor
	11a TPC	36 - 48	5180 - 5240	50 mW	Indoor + outdoor
		52 - 64	5260 - 5320	250 mW	Indoor + outdoor
		100 - 140	5500 - 5700	1000 mW	Indoor + outdoor
		149 - 165	5745 - 5825	1000 mW	Indoor + outdoor
Saudi Arabia	11b 11g 11 g Turbo	1 - 13	2412 - 2472	100 mW	Indoor + outdoor
Serbia	11b 11g 11g Turbo	1 - 13	2412 - 2472	100 mW	Indoor + outdoor
	11a TPC	36 - 48	5180 - 5240	200 mW	Indoor only
	11h DFS+TPC	36 - 64	5180 - 5320	200 mW	Indoor only
		100 - 116	5500 - 5580	1000 mW	Indoor + outdoor
		132 - 140	5660 - 5700	1000 mW	Indoor + outdoor

Country	Mode	CH	MHz	PWR (EIRP)	Use
Singapore	11b 11g	1 - 13	2412 - 2472	100 mW	Indoor + outdoor
	11a TPC	36 - 48	5180 - 5240	200 mW	Indoor + outdoor
		149 - 165	5745 - 5825	1000 mW	Indoor + outdoor
	11h DFS+TPC	52 - 64	5260 - 5320	200 mW	Indoor + outdoor
	11h Turbo DFS+TPC	42 50 58	5210 5250 5290	100 mW	Indoor + outdoor
		152 160	5760 5800	100 mW	Indoor + outdoor
South Africa	11b 11g 11g Turbo	1 - 13	2412 - 2472	100 mW	Indoor + outdoor
	11a TPC	36 - 48	5180 - 5240	60 mW	Indoor only
	11h DFS+TPC	36 - 64	5180 - 5320	200 mW	Indoor only
		100 - 116	5500 - 5580	1000 mW	Indoor + outdoor
		132 - 140	5660 - 5700	1000 mW	Indoor + outdoor
South Korea	11b 11g	1 - 13	2412 - 2472	40 mW (RHS power=10mW /MHz)	Indoor + outdoor
	11a TPC	149 - 161	5745 - 5805	200 mW (RHS power=10mW /MHz)	Indoor + outdoor

Country	Mode	CH	MHz	PWR (EIRP)	Use
Taiwan	11b 11g 11g Turbo	1	2412	200 mW	Indoor + outdoor
		2 - 10	2417 - 2457	1000 mW	Indoor + outdoor
		11	2462	200 mW	Indoor + outdoor
	11a TPC	56 - 64	5280 - 5320	50 mW	Indoor only
		149 - 165	5745 - 5825	1000 mW	Indoor + outdoor
	11h DFS+TPC	100 - 140	5500 - 5700	250 mW	Indoor + outdoor
Turkey	11b 11g 11g Turbo	1 - 13	2412 - 2472	100 mW	Indoor + outdoor
	11a TPC	36 - 48	5180 - 5240	60 mW	Indoor only
	11h DFS+TPC	36 - 64	5180 - 5320	200 mW	Indoor only
Ukraine	11b 11g 11g Turbo	1 - 13	2412 - 2472	100 mW	Indoor + outdoor
	11a TPC	36 - 64	5180 - 5320	200 mW	Indoor + outdoor
Uruguay	11b 11g	1	2412	200 mW	Indoor + outdoor
		2 - 10	2417 - 2457	1000 mW	Indoor + outdoor
		11	2462	200 mW	Indoor + outdoor
	11a TPC	36 - 48	5180 - 5240	200 mW	Indoor only
		149 - 165	5745 - 5825	1000 mW	Indoor + outdoor

Country	Mode	CH	MHz	PWR (EIRP)	Use
United Arab Emirates	11b 11g 11g Turbo	1 - 13	2412 - 2472	100 mW	Indoor + outdoor
	11a TPC	36 - 48	5180 - 5240	200 mW	Indoor only
	11h DFS+TPC	36 - 64	5180 - 5320	200 mW	Indoor only
		100 - 116	5500 - 5580	1000 mW	Indoor only
		132 - 140	5660 - 5700	1000 mW	Indoor only
Venezuela	11b 11g 11g Turbo	1 - 13	2412 - 2472	1000 mW	Indoor + outdoor
	11a TPC	36 - 64	5180 - 5320	200 mW	Indoor only
		149 - 165	5745 - 5825	200 mW	Indoor + outdoor
	11h	52 - 64	5260 - 5320	1000 mW	Indoor + outdoor
United States of America	11b 11g	1	2412	200 mW	Indoor + outdoor
		2 - 10	2417 - 2457	1000 mW	Indoor + outdoor
		11	2462	200 mW	Indoor + outdoor
	11a TPC	36 - 48	5180 - 5240	200 mW	Indoor only
		149 - 165	5745 - 5825	1000 mW	Indoor + outdoor
	11a Turbo TPC	152 160	5760 5800	1000 mW	Indoor + outdoor

Country	Mode	CH	MHz	PWR (EIRP)	Use
Vietnam	11b 11g 11g Turbo	1 - 13	2412 - 2472	100 mW	Indoor + outdoor
	11a TPC	36 - 48	5180 - 5240	200 mW	Indoor only
	11h DFS+TPC	52 - 64	5260 - 5320	200 mW	Indoor + outdoor

The following notice applies only to the SCALANCE W786-2HPW:

Note

Before commissioning the SCALANCE W786-2HPW, check that the Hipath Wireless Controller required for operation is also approved in the country of use.